

Claims

What is claimed is:

1. A medical device, comprising:  
an elongate shaft including a proximal section having a distal end, a distal section having a proximal end, and a connector disposed adjacent to and securing the distal end of the proximal section with the proximal end of the distal section; and  
a filter coupled to the shaft.
  
2. The medical device of claim 1, wherein the proximal section includes a first material and the distal section includes a second material that is different from the first material.
  
3. The medical device of claim 2, wherein the first material includes stainless steel and the second material includes nickel-titanium alloy.
  
4. The medical device of claim 2, wherein the connector is comprised of a third material that is compatible for bonding to both the first and second material.
  
5. The medical device of claim 2, wherein the connector is welded to both the first material and to the second material.

6. The medical device of claim 2, wherein the first material has a first flexibility and the second material has a second flexibility that is more flexible than the first flexibility.

7. The medical device of claim 6, wherein the connector blends the first flexibility with the second flexibility.

8. The medical device of claim 1, wherein the connector is disposed over the distal end of the proximal section and the proximal end of the distal section.

9. The medical device of claim 1, further comprising a bismuth alloy connecting material disposed adjacent the connector.

10. An embolic protection filtering device, comprising:  
a filter wire including a core member, the core member including a proximal region and a distal region, the proximal region comprising a first material and including a distal end, the distal region comprising a second material different from the first material and including a proximal end;

a connector disposed over the distal end of the proximal region and the proximal end of the distal region to secure the proximal and distal regions; and

a filter assembly coupled to the filter wire, the filter assembly including a filter frame and a filter membrane coupled to the filter frame.

11. The filtering device of claim 10, wherein the first material includes stainless steel.

12. The filtering device of claim 10, wherein the second material includes nickel-titanium alloy.

13. The filtering device of claim 10, wherein the connector comprises a third material different from the first material and the second material, the third material being compatible for bonding to both the first and second material.

14. The filtering device of claim 13, wherein the third material includes a nickel-chromium alloy.

15. The filtering device of claim 10, wherein a reduced size portion is defined adjacent at least one of the distal end of the proximal region and the proximal end of the distal region.

16. The filtering device of claim 15, wherein the reduced size portion or portions include a taper.

17. The filtering device of claim 15, wherein both the proximal region and the distal region include a reduced size portion, and wherein the reduced size portion of the proximal region and the reduced size portion of the distal region overlap.

18. The filtering device of claim 15, wherein both the proximal region and the distal region include a reduced size portion, and wherein the reduced size portion of the proximal region and the reduced size portion of the distal region have interlocking shapes.

19. The filtering device of claim 15, wherein both the proximal region and the distal region include a reduced size portion, and wherein the reduced size portion of the proximal region and the reduced size portion of the distal region are joined together to define a butt joint.

20. The filtering device of claim 10, wherein the device further includes a covering over a portion of the core member.

21. The filtering device of claim 20, wherein the covering includes a polymer sheath.

22. The filtering device of claim 22, wherein the covering includes a coil.

23. The filtering device of claim 10, wherein the distal region of the core member include a first section and a second section that are connected by a second connector.

24. An embolic protection filtering device, comprising:

    a filter wire including a core member and a covering disposed over at least a portion of the core member, the core member including a proximal portion and a distal portion, the proximal portion having a first flexibility and including a distal end, the distal portion comprising a second flexibility different from the first flexibility and including a proximal end;

    a connector disposed over the distal end of the proximal portion and the proximal end of the distal portion to secure the proximal and distal portions; and

    a filter assembly coupled to the filter wire, the filter assembly including a filter frame, a filter membrane coupled to the filter frame, and one or more struts extending between the filter frame and the filter wire.

25. The filtering device of claim 24, wherein the proximal portion comprises stainless steel.

26. The filtering device of claim 24, wherein the distal portion comprises nickel-titanium alloy.

27. The filtering device of claim 24, wherein the connector comprises a connector material that is compatible for bonding to both the proximal and distal portions.

28. The filtering device of claim 27, wherein the connector material includes a nickel-chromium alloy.

29. The filtering device of claim 24, wherein a reduced size region is defined adjacent at least one of the distal end of the proximal portion and the proximal end of the distal portion.

30. The filtering device of claim 29, wherein the reduced size region or regions include a taper.

31. The filtering device of claim 29, wherein both the proximal portion and the distal portion include a reduced size region, and wherein the reduced size region of the proximal portion and the reduced size region of the distal portion overlap.

32. The filtering device of claim 29, wherein both the proximal portion and the distal portion include a reduced size region, and wherein the reduced size region of the proximal portion and the reduced size region of the distal portion have interlocking shapes.

33. The filtering device of claim 29, wherein both the proximal portion and the distal portion include a reduced size region, and wherein the reduced size region of the proximal portion and the reduced size region of the distal portion are joined together to define a butt joint.

34. The filtering device of claim 24, wherein the covering includes a polymer sheath.

35. The filtering device of claim 24, wherein the covering includes a coil.

36. The filtering device of claim 24, wherein the distal region of the core member include a first section and a second section that are connected by a second connector.

37. The filtering device of claim 24, further comprising a bismuth alloy connector material disposed adjacent the distal end of the proximal portion and the proximal end of the distal portion.

38. The filtering device of claim 24, wherein the connector is welded to the proximal portion and to the distal portion.

39. An embolic protection filtering device, comprising:  
a filter wire including a core member and a covering disposed over at least a portion of the core member, the core member including a proximal region and a distal region, the proximal region comprising a first material and including a distal end, the distal region comprising a second material different from the first material and including a proximal end;

means for securing the proximal region with the distal region; and  
a filter assembly coupled to the filter wire, the filter assembly including a filter frame, a filter membrane coupled to the filter frame, and one or more struts extending between the filter frame and the filter wire.

40. An embolic protection filtering device, comprising:

a filter wire including a core member and a covering disposed over at least a portion of the core member, the core member including a proximal portion and a distal portion, the proximal portion having a first flexibility and including a distal end, the distal portion comprising a second flexibility different from the first flexibility and including a proximal end;

means for blending the first flexibility with the second flexibility; and

a filter assembly coupled to the filter wire, the filter assembly including a filter frame, a filter membrane coupled to the filter frame, and one or more struts extending between the filter frame and the filter wire.

41. A method for manufacturing a medical device, comprising:

providing a first shaft member having a distal end, the first shaft member comprising a first material;

providing a second shaft member having a proximal end, the second member comprising a second material different from the first material;

connecting the first and second shaft members to define a core member by disposing a connector over the distal end of the first shaft member and the proximal end of the second shaft member; and

coupling a filter to the core member.

42. The method of claim 41, wherein the first material includes stainless steel and the second material includes a nickel-titanium alloy, and connecting the first and second shaft members includes welding the connector to the first and second shaft members.

43. The method of claim 41, wherein connecting the first and second shaft members includes disposing a bismuth alloy connector material adjacent the connector.

44. A method of using a medical device, comprising:

providing a filtering device, the filtering device including an elongate shaft having a filter coupled thereto, the shaft including a proximal section having a distal end, a distal section having a proximal end, and a connector disposed adjacent to and securing the distal end of the proximal section with the proximal end of the distal section;

inserting the filtering device into a blood vessel;

advancing the filtering device through the blood vessel to a location adjacent a target region; and

deploying the filter.